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Climate Tribune

A reflection on Gobeshona 6 conference and way forward

Adnan Qader

The International Centre for Climate Change and Development (ICCCAD) organized the four-day International Conference Gobeshona 6 based on Climate Change Research, at Independent University, Bangladesh (IUB). This year the event marked its sixth year as it took place from 20th January to 24th 2020. The Gobeshona Conference is an annual international conference on knowledge dissemination focusing on research practices that attract academics, practitioners, policymakers and delegates who are involved with work related to climate change and development.

Dr Andrew Norton, Director of International Institute for Environment and Development (IIED), Sheela Patel, Chair of Slum Dwellers International (SDI), Dr David Keith, Professor at Harvard University, hento Tshering, Least Developed Countries (LDC) Representation and Saber Hossain Chowdhury, MP and Chairman Standing Committee of Ministry of Environment, Forest and Climate Change (MoEFCC), GoB and A Matin Chowdhury, Chairman, Board of Trustee, IUB attended the closing ceremony.

Saber Hossain Chowdhury appreciated the depth of the subjects covered in the Gobeshona 6 and the importance of research to be in the frontline of climate change, saying: "We have to leverage science into technology to meet the deficit." He added that with 2020 transitioning into technology dependency, we have to work to leverage research into action, and the midpoint of this will be policy. Stating that "Gobeshona is a platform of good practices", he mentioned he is keen on working long term, to identify action points from this conference that can help policymakers to bring a change for the people.

A Matin Chowdhury, Chairman, Board of Trustee, IUB stated "We have to create leaders, and that is why we are here today." He appreciated that Gobeshona is an event that brings individuals, policymakers, researchers, practitioners from all over the world. He added that he appreciates different stakeholders coming under one roof for the conference.

As the remnants of the 6th annual Gobeshona conference are sinking in and as we reflect on the promises to keep up the fight against climate change, Mother Nature quickly reminded us what is at stake. The Earth saw the hottest January in recorded history last month, continuing an alarming upward trend as the climate crisis accelerates. February was not kind either. The past month has been difficult for climate scientists and practitioners all over the world. The first week of February saw an iceberg a little bigger than the size of Dhaka breaking off from a glacier. Researchers also discovered a dramatic decline in Antarctic penguin colonies. In case all of that was not enough to make you at least a little concerned, yet another unusually high temperature was logged in the Antarctic Peninsula on February 9, at a record-breaking 22 degrees Celsius.

Paving forward for the next year, Dr Saleemul Huq addressed the way forward for Gobeshona and his vision to take ICCCAD beyond as a global centre of excellence working in climate change capacity building. He declared the next Gobeshona 7 to take place on January 21 to 24, 2021. His vision and mission are an essential reminder to the world on Bangladesh's role in tackling the growing issue of climate change. Gobeshona has not only become a platform to share ideas and knowledge; it has also become a centre to unite young scholars and policymakers to think about practical actions to fight climate change. We from the ICCCAD and the Gobeshona family earnestly believe that our actions and efforts will help shed some light for our next generation and Bangladesh. ●

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Upcoming Dengue threat

A non-gendered climate-sensitive disease in Bangladesh

Ashraful Haque and Marwan Tasnim

The infectious disease COVID 19 or commonly known as Coronavirus has now landed in Bangladesh. The next infectious disease ie Dengue is preparing for the monsoon season to wave through Bangladesh. Dengue has been a common bio-hazard in Bangladesh over the last 20 years. The dengue outbreak first impacted the country in 2000; it has more or less been present since. But in 2019, the country experienced one of the largest outbreaks of Dengue disease to date.

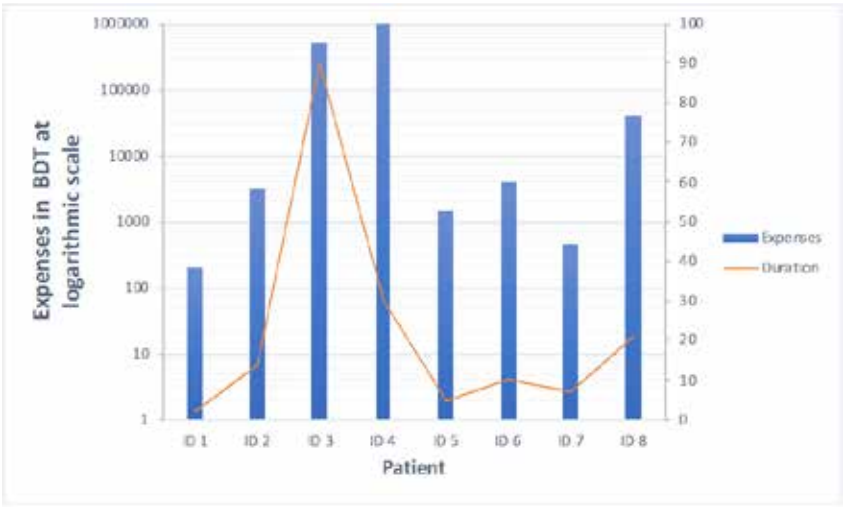

Figure 1: Case study findings of Relationship between number of days of being affected and the financial costings of Dengue in Dhaka City

A case study on the extent of the Dengue problem was conducted by FOREWARN Bangladesh. The study intended to identify the magnitude of the problem in Bangladesh as well as capture the difficulties faced by the patients and family members due to Dengue. Through discussion with several respondents, the study had identified that one of the major problems faced by them was the financial crises. The cost incurred to the families varied widely from 200 taka to 10 lacs depending on two factors- (a) admission to the hospitals and (b) duration of the diseases.

The challenges faced by the patients were lack of doctors and trained nurses; adequate beds in the hospitals; dengue testing kits in the market, etc. However, a common issue faced by patients was that, though free treatment was declared for dengue patients in the government-run hospitals, private hospitals were charging a handsome amount from the patients.

Geographical distribution of Dengue

Cases of Dengue were found throughout the country. In 2019 it was reported that 101,354 patients were affected by the disease. This information was gathered through 41 government and non-government hospitals in Dhaka and other information sent by the relevant civil surgeon offices from those constituencies across Bangladesh. Divisional distribution in the following pie chart shows very apparently that Dhaka is at the highest risk consisting of more than 50% of all other divisions followed by Khulna and Chittagong (Source: Health Emergency Operations Centre and Control Room).

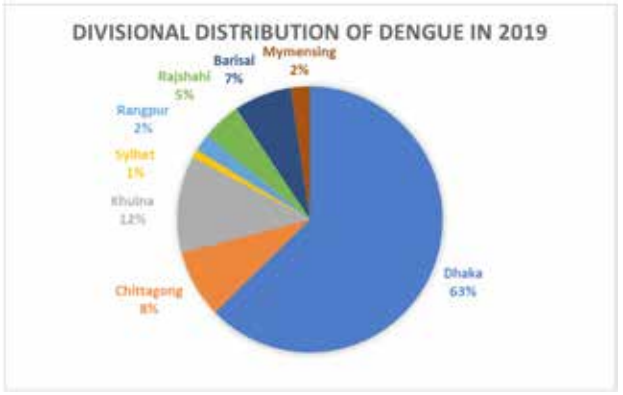

Figure 2: Divisional Distribution of Dengue in 2019 (Source: Health Emergency Operations Centre and Control Room)

Seasonal feature of Dengue disease

The study identified a correlation between seasonal variation and dengue outbreak. It is found that the distribution of dengue patients admitted in the hospital becomes the highest in the month of August. The average pattern shows a very important insight of the temporal distribution of dengue cases ie, the lowest number of cases occur during the dry season, through the end of pre-monsoon and the numbers of patients peak during the monsoon.

Climate Change on the Dengue cases

The pre-monsoon rain between March-May fills up possible containers (eg flower pots, tanks, buckets, cans and bottles) in which *Aedes aegypti* and *Aedes albopictus* lay eggs with consequent population increase; patients numbers remain high until the rainy monsoon season (June-October) and decrease gradually afterwards. There are several works of literature available, having a very strong correlation between the number of dengue cases with cumulative rainfall, maximum temperature and humidity. This study, however, found no correlation between a number of admitted patients and humidity.

It was found that the monthly average rainfall in 2019 during the monsoon season (JJAS) was lower than previous 19 years (2000-2019) but the initial months of the year before the monsoon onset were much better than the previous year's average. Also, comparison between the average maximum temperature of 2019 and the previous 19 years shows that the highest temperature of each of the month was equivalent to the monthly maximum average temperature of 2019. This shows that with the impact of climate change the temperature of the region is continuously increasing and it has been affecting the monsoon period in the country. And this is heavily influencing the impact of dengue in the country. With the increase in the timeframe of monsoon season and rainfall, there has been a rise in the number of dengue patients in the country.

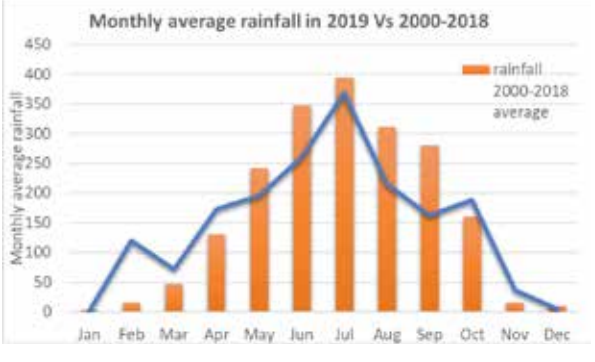

Figure 3: Monthly average rainfall in 2019 during the monsoon season (JJAS) was lower than previous 19 years' average (2000-2018) but the initial months of the year (JFMA) before monsoon onset were much wetter than the previous years' average.

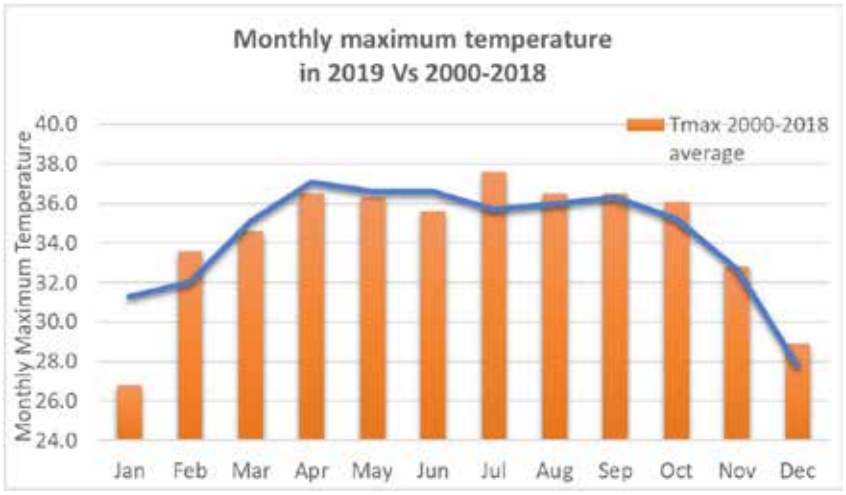

Figure 4: Monthly average temperature in 2019 during the compared previous 19 years' average (2000-2018) but the initial months of the year (JFMA) before monsoon onset were much wetter than the previous years' average.

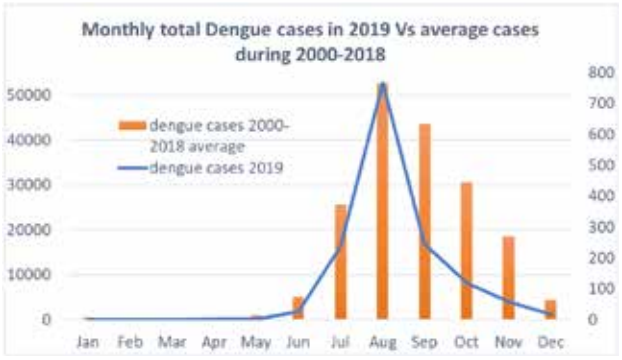

Figure 5: Monthly total cases of dengue patient in 2019 and average number of monthly patient from 2000-2018

The correlation between increase of dengue patients with cumulative temperature and rainfall shows that if climate is changing for better or worse it will have a strong impact on the prevalence of dengue in the country. Simon Hales and their colleagues (2002) showed that at current population growth 35% world population is at risk of dengue whereas this percentage could be 50% population if the climate change is considered.

Gender and age dimension of Dengue

Dengue is a non-gendered disease which can affect men and women equally. There has been no correlation found between the sex of patients and Aedes mosquito virus transmission. According to WHO, there is no discrimination of the age group because all age groups are at risk. A recent population-based study reported no sex difference in dengue seroprevalence in Dhaka (ICDDRB, 2012).

Way forward: Actions to tackle Dengue

The Government of Bangladesh has taken many actions to reduce the impact of dengue in the country. But there are still many gaps existing. Some of the interventions that were identified from the study are:

1. Epidemiological Surveillance
2. Outbreak Response
3. Capacity Building
4. Behaviour Change
5. Inter-sector Collaboration
6. Monitoring and Evaluation

From the above intervention options, it can be summarized that there has been ample scope for improvement in the following areas of *early action, coordinated surveillance,* and *rapid response.* ●

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Marwa Tasnim, Partnership Officer, International Centre for Climate Change and Development (ICCCAD) has a research focus on Climate-induced Disaster, Management Options and Resilience

Climate services to redesign DRR in Bangladesh

Ashraful Haque

In this development of Disaster Risk Reduction discourse in Bangladesh, climate services are becoming a new discipline to produce, translate, transfer and use climate information across many sectors. Bangladesh has evolved into an excellent example of being resilient to disaster, but this journey was not comfortable; it went through the following phases.

First phase

The first phase was active until 1991; back then, it was the Bengal Famine Act that was the directive to manage any disaster. Relief and rehabilitation (emergency response) were at the centre of disaster management.

Second phase

The 1988 flood and the cyclone in 1991, took a devastating toll on the country, creating a need for a new paradigm of disaster management. Disaster Management Bureau and the draft of Standing Order on Disaster (SOD) came into existence in 1993 as a consequence of that disaster. The priority from relief and rehabilitation got new attention towards more awareness and preparedness to reduce the loss incurred from disaster. This phase lasted until the adoption of the Hyogo Framework for Action.

Third phase

In January 2005, 168 governments adopted the Hyogo Framework for Action (HFA) for the period 2005-2015 in order to make the world safer from *all-natural hazards*. It had the strategic areas of reducing risks, being prepared and ready to act. Bangladesh prepared her first National Adaptation Programme of Action (NAPA 2005), where disasters have been addressed in strategy 4, 5, 6, 15. Preparedness and awareness-raising among climate-vulnerable areas got priority to tackle enhanced disasters. It was for the first time that climate change was considered in disaster management for Bangladesh.

Moreover, exploring insurance and other emergency preparedness options to reduce the risks in advance drew attention to this policy document. Besides, the Disaster Management Act was enacted in 2012 to make coordinated, object-oriented and strengthened activities by government, non-government and private sectors to fight all types of disaster. Here Bangladesh was ahead of HFA by addressing risk caused by natural as well as human-made hazards.

Fourth phase

On 18 March 2015 UN member states adopted Sendai Framework for disaster risk reduction for the period 2015-2030. This framework aims to guide the multi-hazard management of disaster risk in development at all levels and within and across all sectors. Whereas, Sustainable Development Goals (SDG 17) was adopted in September 2015 at the UN Summit. These two international guidelines are entwined into the national policies in such a manner that previous discourse of disaster management has transitioned from reactive to a proactive approach.

Climate services will help individuals and organizations in society to make the improved ex-ante decision, through better anticipation and building rapid response infrastructure. Bringing climate information and its uses in every sector would capacitate us to understand the present and future risks of a disaster well to act proactively with available resources. Recently, FOREWARN Bangladesh is trying to build the expertise groups from different stakeholders to lead this anticipation window providing adequate analysis to prevent new risk while reducing existing risks through access to climate services. ●

Ashraful Haque is a system analyst. He has been working as Senior Research Officer at ICCCAD. Also, he is working as Coordinator of FOREWARN Bangladesh.

Reflecting on Bangladesh Academy for Climate Services (BACS)

A model for scaling-up climate services efforts in Bangladesh

Tasfia Tasnim and Farah Anzum

Climate change is a defining issue of our time, and we have been talking a lot about adaptation or sustainable development goals (SDGs). All these climate sensitive sectors require climate information that raises the increasing demand for climate services. On one hand, it is very difficult to know what the future climate will look like, and with the current trend, it is very likely that the year-to-year climate variability will Increase. Hence, we would need to improve adaptation not only for the long-term but also to the current climate. Therefore, we need to produce short-term projections rather than long-term forecasting.

But there has always been a gap between the people providing the climate information, and people needing the climate information. Where on one hand, the user community is confused about which data to trust, on the other hand, the science community does not know in what format the data should be communicated. Another issue is that, in developing countries like Bangladesh, resources put into parallel, and there is a lot of duplication of efforts due to lack of communication which eventually results in misuse of resources.

Here comes the idea of climate services which is to generate information from the best possible science, then translate and transfer them to the beneficiaries efficiently and finally use them for policies and planning. Scaling up climate services requires increased investment, which in turn requires improved understanding of climate risks, climate impacts in specific sectors and climate-resilient strategies, as well as better coordination of generation, translation, communication and use of climate services. To address these issues, International Centre for Climate Change and Development (ICCCAD), International Research Institute for Climate and Society (IRI) at Columbia University, International Maize and Wheat Improvement Centre (CIMMYT), and Bangladesh Meteorological Department (BMD) co-founded the Bangladesh Academy for Climate Services (BACS) in January 2018. This academy is the very first of its kind in Bangladesh, and goes beyond the disconnected, ad-hoc, one-off workshop-based format of project-based activities by prioritizing holistic, high quality and sustainable capacity building to achieve the climate services goal.

So far, two training dialogues and few thematic workshops have been conducted under the BACS umbrella. All of these efforts are targeted to build the capacity of different stakeholders working in climate services so that they are able to identify, analyze and communicate about the climate impacts affecting their decisions. In these platforms, they can discuss the needs for climate information, and processes to improve the integration of climate information into their decision-making process.

MHM Mostafa Rahman, one of the BACS Alumni, has been involved with climate services for the last 24 years. He has worked for rural development, focusing on agriculture and aquaculture extension and natural resource management. According to him, "Adaptation techniques are not new in Bangladesh. Even though, the training helps us to consider weather forecasts in formulating sound decisions for adaptation." Having this training, he has developed a protocol to introduce Climate Service for Aquaculture and produce a video to inform the climate risk management (CRM) among smallholder fishermen. He shared his knowledge and experience as a motivational speaker in the next BACS training dialogue. His relentless effort in spreading the knowledge of climatic variability has been helping farmers significantly to better adapt to climate change risks and BACS has played a prominent role in that notion.

On the other hand, Dr Md Kamrul Islam's story reflected the importance of climate services in the government sectors. He is the Senior Scientific Officer at the Development Board and an alumnus of First batch of BACS training. Currently, he is leading a project on 'Enhancing Capacity in Cotton Varieties Development', where optimum sowing time is significantly affected by weather conditions. Before the training, they never considered the climatic variability into planning. But afterwards, they started to analyze the seasonal variations and planned the production accordingly, which resulted in higher yield. In contrast, Khandakar Mohammad Rashed Iftekher is the Upazila Agriculture Officer under the Department of Agricultural Extension (DAE). He participated in the 'Insurance Workshop on Data for Climate Risk' where he shared his experiences and learnt about others challenges and needs in the insurance sector. Considering the importance of integrating climate information in different sectors, he mentioned, "The present status of data on climate risks are not enough and emphasize should be given on the data for various appliances of insurance at the ground level".

Moreover, Mohammad Abdul Kader works as a Weather Content Specialist at Win Miaki Ltd. and holds 8 years of experience in the field of ICT based weather, agro-met advisory content development and capacity development initiatives of CBOs in agriculture and aquaculture sector. He joined the ENACTS Launch Workshop and mentioned, "The best feature of ENACTS Maproom is the potential to generate weather forecast for several remote places in Bangladesh, even at the absence of weather stations." Considering the abundant potentials of ENACTS, he wishes to attend further events to learn on climate data modeling and use them in weather index based insurance purposes in future.

Md Sultan Mohmud, currently working at the WorldFish in Carp-GIP project, is an alumnus from the second BACS Training. The climate forecasting session was found to be the most useful learning to him. it helped him to prepare the yearly work plan for the fish rearing and breeding. He stated, "The regularly e-mail notification by BMD on climate forecast has been a great resource for us. Additionally, ENACTS Maproom will play one of the most beneficial instruments for climate services in Bangladesh." On the other hand, Md. Mizanur Rahman who is the Training and Extension Coordinator of World Fish-Pranti Aquaculture Ltd., involves conducting training and needs assessment of field facilitator, developing modules on climate smart agriculture and providing technical support. Participating in the training, he mentioned, "I gained a lot of knowledge on weather forecasting in aquaculture, effects of El Nino and La Nina, information collection through mobile phone and crop and species selection considering climate change. Now, I use them in our training courses and collect climate information during cultivation and harvesting of crops. I also disseminate that information to others."

> "There has always been a gap between the people providing the climate information, and people needing the climate information

All of these stories reflect that BACS model enables successful identification of the full spectrum of needs and building capacity strategically across four pillars of climate services and relevant sectors. This model is an effort to initiate similar academies in other countries, and support cross country and south-south collaboration initiatives. All the partners working with BACS are playing a complementary role to contribute more towards knowledge management around the issue of climate services. ●

Tasfia Tasnim works at ICCCAD. By degree, she is a planner. Her working majors are climate finance, livelihood resilience and natural resource management connected to socio-cultural dynamics.

Farah Anzum is a Research Associate at ICCCAD. She has pursued her education in the field of Environmental Management and Economics. Her field of involvement includes climate finance and services, natural resource management and environmental economics.

Integrated water management approach: A story from Patuakhali

Lessons from the Blue Gold Program

Sadia Afrin

The Blue Gold Program is a program focused on water management for development, a project of Bangladesh Water Development Board (BWDB) and Department of Agricultural Extension (DAE). Their target is to reduce poverty for 150,000 households living in 160,000ha area of selected coastal polders, by creating a healthy living environment and sustainable socio-economic development. Due to the effect of extreme events, people living in the coastal polders are vulnerable to salinity intrusion and are facing the impacts of severe events for example cyclones. Moreover, in the Patuakhali area, water scarcity is frequently reported rather than waterlogging.

To address this situation, the governments of Bangladesh and the Netherlands have agreed to support the development of the coastal region through participatory water management (PWM) and agricultural production with a business-orientation. The Blue Gold Program (BGP) has been a combined effort of climate developments in the country. The program is trying to enhance the dialogue initiation between researchers, practitioners, beneficiaries and policymakers and is trying to make water management organizations sustainable. The activities under the program have been making a difference as we will explore below.

The table here summarizes the initiative taken under the program and the key outcomes from them.

Water Management Officers in Patuakhali were interviewed to understand the current state of sluice control. The research found that sluice control in the area is around 25%. Some sustainability issues of the PWM approach represent an alarming situations. WMG's admitted that they need to take more responsibilities for the improvement of water management. There is a lack of financial resources of WMG's yet members are reluctant to provide voluntary work. WMG's often realized the only way to achieve a successful outcome is the continuity of BGP.

Expansion of land use for boro rice crops, especially hybrids, were significant in the Blue Gold research. The increase yield of rice paddy, aquaculture and watermelon farming in some polders were significant.

Improved water management had increased the cropping intensity. Cropping intensity has increased with "Gher" around 41% than before. Significant changes have been followed in crop pattern after BGP participation. Net farming incomes have changed. Before BGP, land under Aman was almost the same while Gher was less than half. After BGP, Aman land remains the same but Gher area has doubled.

Some improvement options that can be addressed from the Blue Gold program for long term impacts are; Union Parishad forming Community-Based Organizations; assigning polder tax; better linkage of local water management to national water governance; Vegetable cultivation on the dyke of Gher; irrigation of non-rice crops eg watermelon, vegetable, fruit on higher ground could be more supported (more profitable than Gher); less emphasis given on mung bean and sesame.

The program also identified that women are participating more than men, due to their participation women labour market has changed simultaneously. Blue Gold is helping WMOs for Water movement in Patuakhali. Culverts are being built up because cultivation needs more water. Around 70% people in Patuakhali, now work under WMGs collaboration with Blue Gold. Blue Gold has provided them with fish cultivation training, good quality seeds to grow mung bean crops, duck-chicken rearing, school field facilities. People now cultivate vegetables along the khals and they sell those products collaboratively in the market to get at a high profit.

Beneficiary of the program had sold around 260 maund paddy through collective marketing in December 2019. They gained knowledge about high and low land, where to create khals, culverts, etc through training sessions provided by WMA. WMG's make an annual map on each phase of their activities for proper water management. River erosion in catchment area is a big issue in Patuakhali to work on.

The investment Blue Gold program got, is expected to return quickly for Water Management as per as the progress on integrated water management programs. Blue Gold has initiated some steps toward how the water management committee can work together. WMGs and WMAs need to rethink to be effective for the main infrastructure. Need huge investment and good intervention in place. Effective water management organization needs elections, 12-member executive committee, monthly meetings, resolution books, maintenance fund, account keeping, audits, annual general meeting in polder water management.


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Most importantly, government plays a role in controlling the effectiveness of the actions mentioned. The action should be started by forming an ad hoc polder-level Water Management Association. For developing a functional Water Management Association more attention should be given on strong networks with Union Parishads and other local actors. ●

Initiatives	Limitations	Outcomes
• Operation and maintenance agreement with bwdb. • Union parishad is backing water management organization (wmo) s to control sluices and khals. • Small scale infrastructure for the water management within the polder is helping to optimize the polder for water management. • The productivity of land in coastal bangladesh is improved by participatory water management approach. • 50 Percent sluices are under wmo's control through the introduction of small infrastructures.	• Limited consultation of WMOs in planning, construction supervision by Water Management Association (WMA). • Around 40-60% of Water Management groups from Completed Participatory Water Management (PWM) projects perform poorly or very poorly, are dormant or inactive. • Cost-sharing for main infrastructure not explored. • Capacity building is only through short-duration projects.	• Only 9% of Water Management Groups (WMGs) reported 'bad' or 'very bad' water management conditions compared to 59 percent prior to the Blue gold program. • Water management infrastructures have been improved in 86% WMG areas. • Benefits of embankments extend beyond WMOs, representing 60% of the beneficiaries. • Improvement in infrastructure was derived by re-excavation of khals by 80% WMGs and khal cleaning, sluice repairs, new /repaired culverts, better sluice operation and repaired embankments by 30-50% WMGs.

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Grass roots action

Knowledge producers partnering with change makers on the ground


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Shahrin Mannan

In its 6th year, the annual Gobeshona Conference went international with more than 70 international participants coming from both least developed and developed countries. The two major groups among these participants were representatives of Grass-roots and 2050 Collectives and Least Developed Countries University Consortium on Climate Change (LUCCC).

To make the best use of having all these international participants from different countries with the same agenda, ICCCAD has organized different side events along with its regular scientific research and policy dialogue days. One of such side events were the "Grass-roots and 2050 Collectives Planning Workshop," which was a half day workshop that took place on January 21 at the main Gobeshona Conference venue.

The main two groups of participants in this workshop were the LUCCC group and the Grass-roots group. LUCCC, a south-south collaborative network of 10 universities of Asia and Africa has been established to enhance capacity on climate change in all 47 LDCs through education, research and training to enable them to adapt effectively to the adverse impacts of climate change. The Grass-roots and the 2050 Collectives on the other hand is a platform created for grass-roots organizations to find a common message which can help to bring recognition, voice and influence for the grass-roots.

With initial exchange of ideas starting from 2009, the first planning meeting of the 2050 Collectives was carried out in CBA13 at Addis Ababa with support from Global Resilience Partnership (GRP). After a couple of virtual dialogues, the first planning workshop took place at the London Climate Week where capabilities, resources, long term vision and research priorities were identified followed by a strong presence at the Climate Summit in September, 2019. Since then, this group has been working to make the voices, needs, priorities and interests of grass-roots fully considered and recognized in climate decision making at all levels.

The basic idea of bringing these two groups together was to create a two way learning process where the grass-roots representatives will highlight how their organizations and grass-roots communities at large, play a major role in resilience building; LUCCC representatives on the other hand can understand the community perspective and help build their capacity by providing technical and scientific support.

To start with the discussion between these two groups, it was important to understand the organizational development capacity of the Grass-roots as well as their focus on climate change and resilience building. By working collectively, the 2050 Collectives platform has chalked out the elements which the Grass-roots want to catalyze by working together; which are- collaborative partnerships, voice and power, influence, recognition and participation, and strengthening individual and collective capabilities.

The overarching goal behind all these activities is to change the narrative of grass-roots communities being victims of climate change and establish and prepare them as change makers. Capacity building of communities and translating their work at the international level is an integral part of this process. The provision of skill, knowledge and resources directly on the ground is one way of strengthening capacities. While undertaking all the capacity building interventions, they come across few challenges, such as writing proposals and access to funds on the ground, which becomes difficult especially while working with the global north.

To overcome this challenge, developing the capacity of local researchers about international requirements and processes is important. Development of leadership skills among the community members and especially among women is also crucial. Transforming grass-roots women as leaders, four interlocking elements should be looked at- investment in organizing leadership building workshops, having enough space and resources to take actions, innovations and experiments to build relationships and networks and a comprehensive framework which looks into all the issues of scale.

Dissemination of learnings and information among the grass-roots is also an important element on which the grass-roots organizations are working on through a participatory integrated community development approach. Governance is also an integral part of the process and when it is not ensured properly, the organizations undertake alternative strategies to get things done.

While the Grass-roots play a vital role in community based adaptation and overall resilience building, they also come across an array of challenges and gaps. Through this workshop, the two groups worked together to identify the needs and requirements of the grass-roots communities in different parts of the world and brainstormed potential opportunities to accommodate all the needs in order to present concrete action points.

The most talked about needs of the grass-roots were for development of effective enumeration tools to highlight and showcase their works, availability of climate related data and development of concrete scientific methodologies of doing research and converting them into actions, ensure access to climate finance at the local level, and establishment of a good platform where all the relevant organizations can meet periodically and discuss collective actions.

The range of supports which the LUCCC group have identified to provide are: accumulation of information from the ground and document different stories from the grass-roots, development of scientific methodologies for research which can be easily used by the communities, creation of knowledge space for both parties and hold seminars, workshops and dialogues for knowledge production. In terms of ensuring access to climate finance at the local level, use of existing or newly formed federations to access climate finance can be a very good option. Exploring Public-Private Partnership (PPP) opportunities can also be an effective way of creating a sustainable model which will lead to evidence based results and ensure investments.

With this ongoing discussion, these two groups plan to sit together in the upcoming CBA14 at Bangkok in May 2020 for identifying further ways of collaboration and development of a road map for 2020 of the 2050 Collectives. ●

Shahrin Mannan currently works as a Senior Research Officer at the International Centre for Climate Change and Development (ICCCAD). Her research interest lies in community-based adaptation, gender and climate change, and sustainable development.

Developing environment-friendly and profitable rice varieties

Lessons learned from IRRI

Hafizur Rahman

Often cited as one of the most vulnerable countries to climate change, Bangladesh faces significant challenges in adapting to the impacts of climate change. The country is particularly susceptible to extreme weather events which include cyclones, floods, storm surges drought, among other events. In the last few decades, these events, especially floods, have resulted in human and material loss. Consequently, sea-level rise and an increase in salinity threaten the country's coastal region's ability to produce rice. Adding to these woes, heat stress in the region has already reached critical levels, which is unsuitable for rice production.

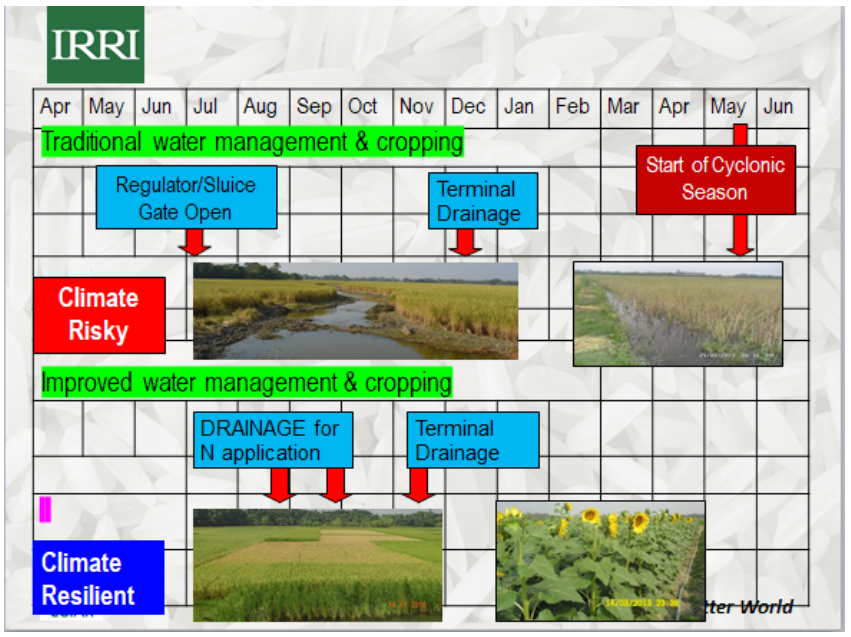
International Rice Research Institute (IRRI) has been assisting with the national agricultural research and extension systems. The institute has been involved with both formulation and implementation of rice sector strategies in the country. Based on the geographical location, IRRI has developed some advanced rice varieties that yield more grain and can withstand pests, diseases as well as flooding, drought, and other harmful effects of climate change. IRRI has developed these varieties on the principles of; increase in genetic gain; improved breeding strategies; and improved product profiles for rice production.

The coastal zone of Bangladesh is rich with water resources, and this offers massive potential for Bangladesh to make a quantum leap in meeting future food security requirement. However, the region is being threatened by increasing salinity. As the soils in this region are affected by varying degree of salinity, the soil has to be monitored to identify the salt-tolerant varieties that will work best.

IRRI has been working on interventions while monitoring water salinity and quantity (depth, flow rates) in the rivers. In essence, the water depth in the rivers throughout the year, relative to the land surface has to be monitored so that farmers know how to irrigate with fresh water.

- Too much water during the rainy season, hence the need to be able to drain the field
- Too little freshwater during the dry season, hence the need to be able to store freshwater for irrigation
- Too much soil salinity during the dry season for agricultural crops - but if it can be irrigated with fresh water, then crops can grow on moderately saline land

In Bangladesh, most climate risk season lies in April, May, June and early December to early January. Therefore if these periods are mainly focused on by the farmers to seek alternative livelihood or crop production, then the farmer's earnings can be secured.



IRRI Water Management and Cropping Plan

Based on IRRI's research, that was presented at Gobeshona 6 conference. In most cases, farmers working with IRRI are dependent on the popular varieties like as BRRI Dhan 11, BIRI Dhan 29, Aman BIRI Dhan 28, Aman BRRI Dhan 32, Aman BRRI Dhan 49, Aush BR 26, Aush BRRI Dhan 48, and Boro BR 16. Some of these new rice varieties are more environmentally friendly and more profitable like as BIRI Dhan 35, BIRI Dhan 63 and BIRI Dhan 81.

Rice marketing in Bangladesh is marred by a wide range of problems, including packaging, transporting, storage, distribution, and pricing. There is a comparative advantage in the production of high yielding rice in Bangladesh, but its marketing system is not suitable for small farmers to bring a fair price. Moreover, due to climate change, the country is losing out on seasonal crops as seasons are changing patterns.

To overcome the challenges faced by farmers in the coastal zone, and especially our food system being potentially threatened by adversities of climate change, Farmers need to focus on alternative farming or livelihood option to support themselves. More focus should be given in resourceful utilization of technology to identify particular rice varieties that are sustainable are ecologically beneficial and has a market value. Only then a particular rice variety will be well adopted by farmers and consumers alike and will help curb the food insecurity problems in the coastal zone of the country. ●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Water, world, and security

Looking into water resources from the security perspective

Sumaiya Binte Anwar

Pond preserved by World Vision to supply drinking water for the local people in Mongla Port Municipality.

PHOTO: SUMAIYA BINTE ANWAR

Riverine Bangladesh is largely dependent on natural sources such as water for living. It has 24,000 km of rivers flowing through its fertile land. Fifty-Seven transboundary rivers feed into Bangladesh creating the world's second-largest riverine drainage basin, the Ganges-Brahmaputra-Meghna (GMB) Basin. Despite the abundance of water, providing adequate safe drinking water for everyone is a complex national problem. Climate events impact on the hydrological cycle and put additional pressure on the already strained water resources of the country. Therefore, it is imperative to understand the dynamics of water resources from the security perspective.

A recent report by the Intergovernmental Panel on Climate Change (IPCC) states that "water and its availability and quality will be the main pressures on, and issues for, societies and the environment under climate change." Low lying countries such as Bangladesh are likely to be hit hard by the environmental phenomenon, which will bring abnormal weather conditions, leading to severe water shortages and contamination. A study by World Bank also indicates that climate change will dramatically increase river and groundwater salinity by 2050 and create a shortage of drinking water and irrigation in the southwest coastal areas of Bangladesh - affecting the livelihoods of at least 2.9 million poor in the region where 1.5 million are already struggling for potable water.

Rising salinity levels are one issue of concern in Bangladesh, particularly in the coastal areas. The rising of salinity levels is primarily because of the lack of water flow in rivers. Being the lowest riparian country in the GMB basin, Bangladesh is highly susceptible to run-off from the upper riparian states with 92.5% of the countries surface water provided by out of the country sources. Therefore, challenges due to the dynamics of high-water recharge during monsoon and low-water recharge during dry season depend not only on the monsoon rainfall pattern and variability but also on the water management practices of the neighbouring countries.

In 2009, Cyclone Aila hit Bangladesh and damaged most of its water infrastructures and contaminated the surface water sources in the country's South Western region. In the coastal area of Satkhira, tidal flooding, inundation by storm surges and salt-water intrusion has led to rising salinity levels in both shallow and deep aquifers, leaving most of the people dependent on surface water for drinking and cooking.

Besides, there is an alarming decline in groundwater sources as water quality deteriorates. Bangladesh remains the country with the largest proportion of people exposed to arsenic contamination in the world; aggravating water stress in the North as arsenic from the mountains seeps into groundwater poisoning anyone drinking it.

The use of Pond Sand Filter (PSF) and preservation of Khash ponds can be a potential way of combating the water crisis. The government already has a water act set in place to preserve the Khash ponds for drinking purposes. Various researches and scoping projects are being carried out in collaboration with Oxfam, World Vision and WaterAid to create a geospatial database to map out the Khas ponds in Shatkhira district. It aims to formulate a planning process by preserving these Khas ponds and mobilize the community for using these pond water for drinking purposes.

Water is among the most contested resources in South Asia. To ensure proper management, it is imperative that the existing gap in policy; lack of harmonization among the inter-government and intra government institutions are addressed properly. There are ongoing studies on water security issues in the Water Aid working areas of Bangladesh looking into the existing policy and gaps in the water governance issues. However, further interdisciplinary research and modelling techniques should be introduced to take a leap beyond the research and to put forward the research into action. ●

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A walk through the Climate Technology Park

Tania Ahmed

The Christian Commission for Development in Bangladesh's Climate Technology Park (CCDB) is a beautiful haven just outside of Dhaka city. Located in Sreepur, Gazipur, the 53-acre park is lush with trees, grass, and flowers that usher in crispness to the air. The park is not only a place to stroll through on a sunny day but a centre of knowledge, housing more than fifty different adaptation technologies utilized in Bangladesh. Visitors come to learn about how climate change is affecting the country across its five main climatic zones: coastal, dry, Charland, hilly, and haor, and how locals are handling their rapidly changing environments with low cost yet effective technologies.

On the morning of Friday, January 24, 2020, international participants of the Gobeshona 6 conference, along with conference organizers and volunteers, travelled to the park to learn about the park's adaptation technologies. Greeted with multi-coloured flowers, participants received a warm welcome as they were ushered into the meeting room for a brief orientation of the park. After the introduction, CCDB staff led participants outside for the walking tour.

Participants saw The Climate Learning Centre under construction, which will be a LEED-certified building. The innovative and user-friendly technologies they saw ranged from a natural refrigerator built with bricks to floating gardens made to withstand floods. Other technologies included a solar irrigation system that harnesses the sun's energy to water fields efficiently, a vertical agriculture structure that optimizes space and reused plastic bottles as planters, and bracelets for women that signal dangerous carbon monoxide levels in their homes. Participants' raised questions on each of the technologies, their curiosity piqued.

After making the round in the park, participants were exposed to further technologies in the office. There were utensils made out of compostable materials, an insulator that finishes cooking dishes that are already halfway done, saving on firewood for fuel, and a straw that filters out particles from water, making it safe to drink.

The tour ended with some leisure time spent playing football, petting the resident puppies, and swinging. Over a traditional Bengali lunch, participants bonded over their experiences of the park and got to know one another. The trip to CCDB park was an informative, inspiring, and refreshing, and a glimpse into the reality of climate change adaptation in Bangladesh. ●

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